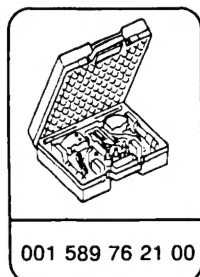
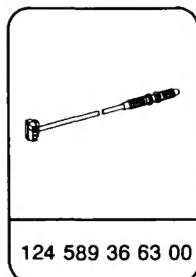


Engines 102 103 104 119 120 601 602 603

## Special tools



001 589 76 21 00



124 589 36 63 00

**Note:** Turn crankshaft using starter and compression test recorder on all models except 140. Use ignition switch on model 140.



### IMPORTANT NOTE!

Model 124.034/036, 129, 140

Certain connectors must be disconnected when turning the crankshaft. This results in the setting of Diagnostic Trouble Codes which must then be erased from the following control modules:

- LH-SFI control module.
- Ignition control module.
- Diagnostic module, if equipped.

(Refer to Diagnostic Manual, Engines, Vol. 2, 3).



### WARNING!

Because of the high ignition voltage on gasoline engines, it is dangerous to touch ignition components (ignition coil, ignition cables, spark plug connector, module push connectors) when

- the engine is running,
- the engine is being started,
- the key is in position 2 while the engine is being turned manually.

**Gefährliche Hochspannung!**  
Vorsicht bei Arbeiten an der Zündanlage

**Danger! High voltage**  
Observe caution when working on the ignition system

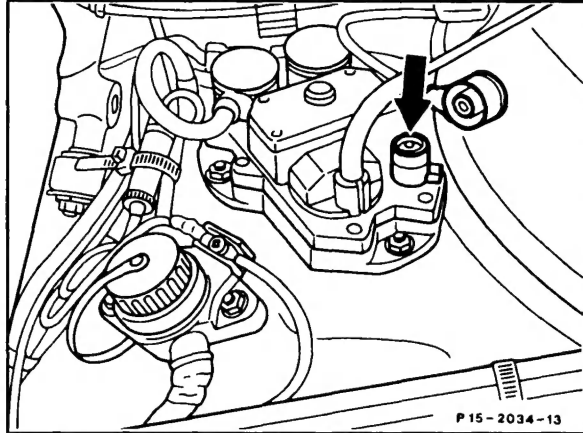
**Danger! Haute tension**  
Attention lors de travaux au système d'allumage

P01-5329-13

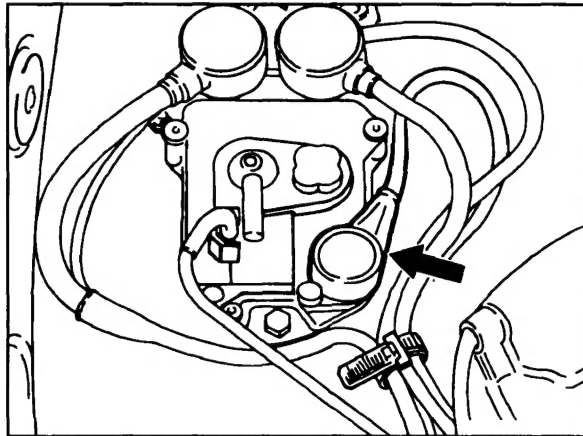
**Disabling Ignition**

- Switch off ignition on gasoline engines. Pull off plug from crankshaft position sensor (green or black cable) on control module (arrow).

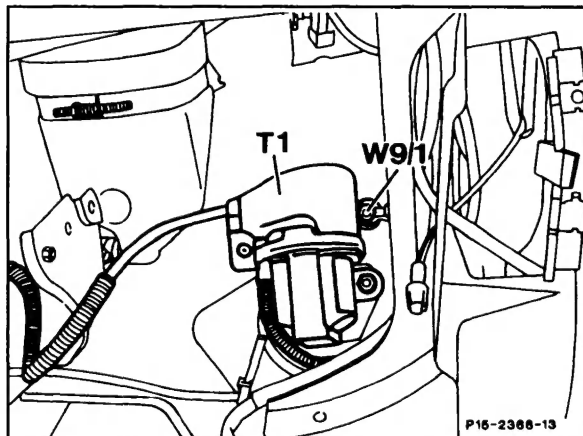
Model 201 with TSZ ignition control module



Models 124, 126, 129 and 201  
with EZL ignition control module



Disconnect connector on model 140

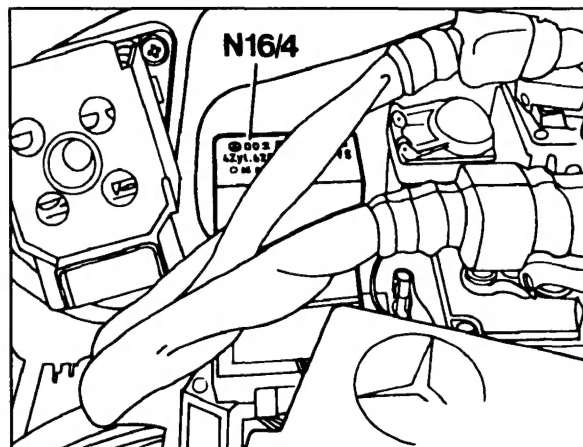


## Disabling fuel supply and connecting remote starter switch

**Model 124, 126, 201 except model 124 starting model year 1990 and model 201.029 starting model year 1990**

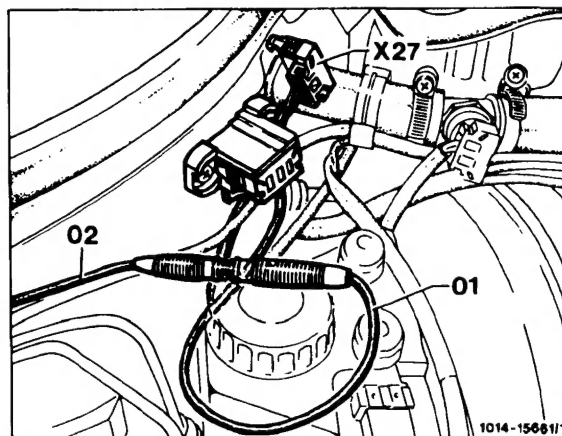
- Before turning the engine, the fuel pump relay module (N16/4) should be pulled out, so that no fuel is injected into the engine.

Shown on model 201

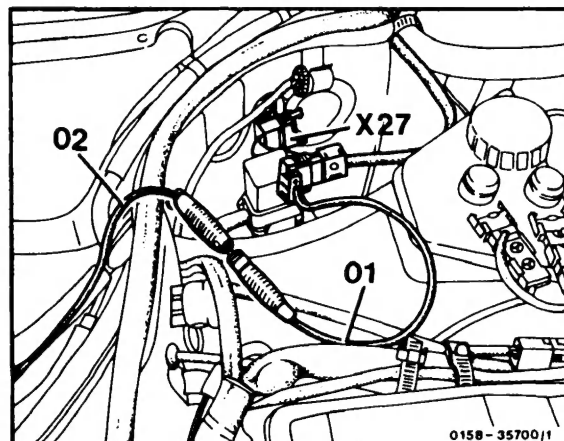


- Connect compression test recorder to battery positive (circuit 30) and to the plug (circuit 50) of the connector (X27). Insert adapter cable 124 589 36 63 00 (01) in the cable (02) of the compression test recorder.

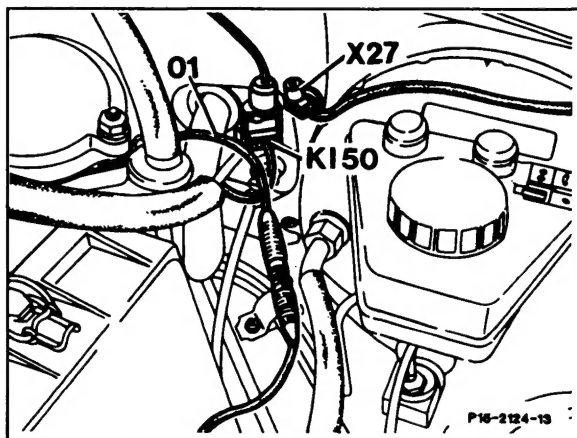
Model 124, left side component compartment wall



Model 126, left side of fire wall



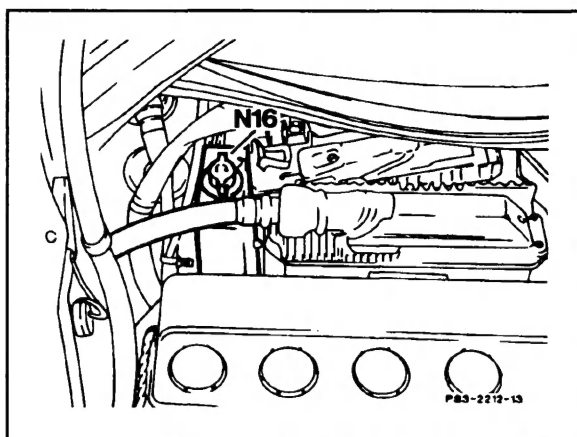
Model 201, left side component compartment wall



**Model 124 with Engine 103, 104 starting model year 1990,  
Model 201.029 starting model year 1990**

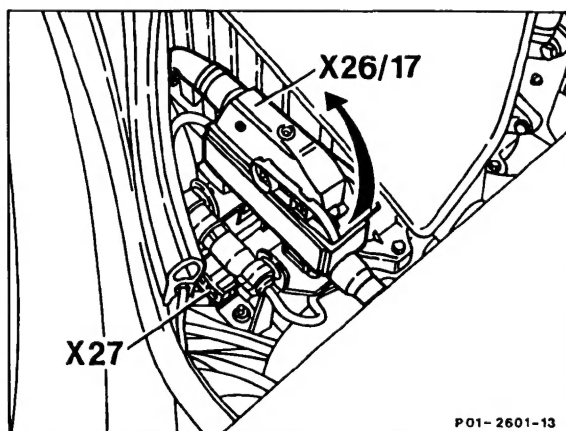
- Remove component compartment cover.
- To interrupt fuel supply, remove engine systems control module (MAS) (N16) by turning locking knob from position 1 to position 0. Pull unit up.

Shown on model 124

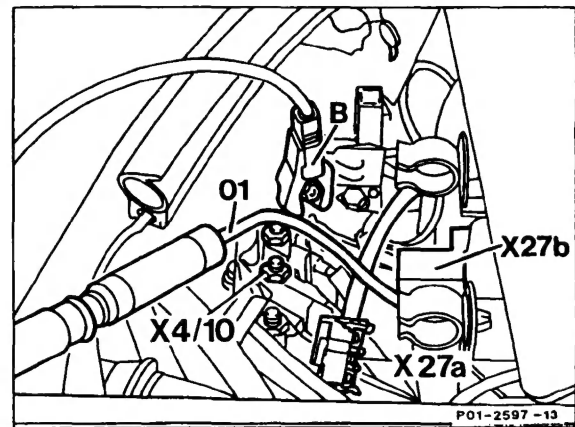


**Model 124 with engine 119**

- In order to interrupt the fuel supply, disconnect engine plug connection (X26/17) of engine wiring harness on right side of vehicle.

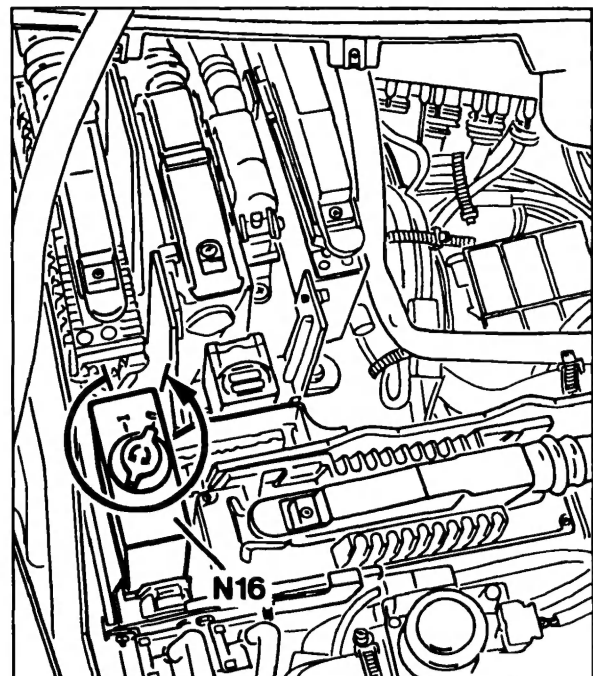


- Remove component compartment cover. Connect remote starter switch to starter harness connector (X27) (circuit 50) and to terminal block (X4/10) (circuit 30) position B located behind Module box.



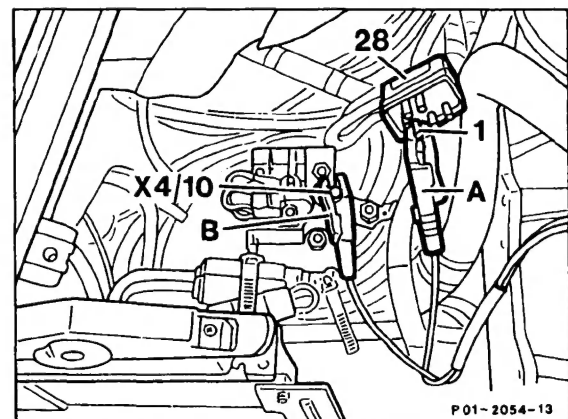
## Model 129

- Remove component compartment cover
- To interrupt fuel supply, remove engine systems control module (MAS) (N16) by turning locking knob from position 1 to position 0. Pull unit up.



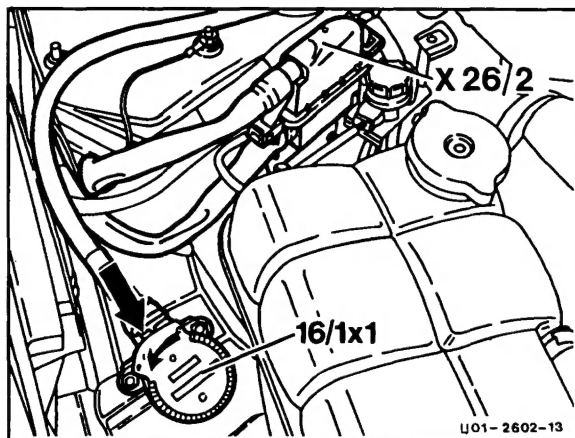
## Model 129

- Disconnect plug (28) from starter harness connector (X27). Connect remote compression tester clamp (A) to plug (28) pin 1 (circuit 50) and clamp (B) to terminal block (X4/10) (Circuit 30).

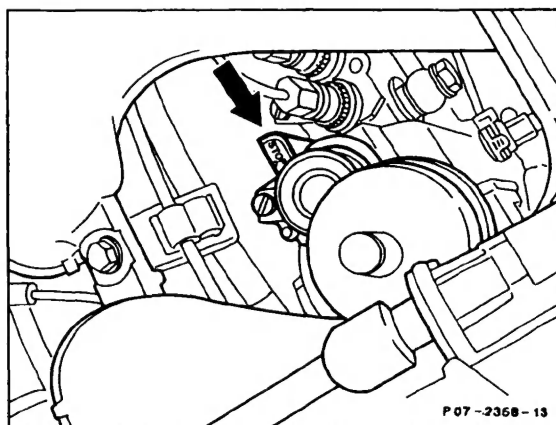


**Model 140**

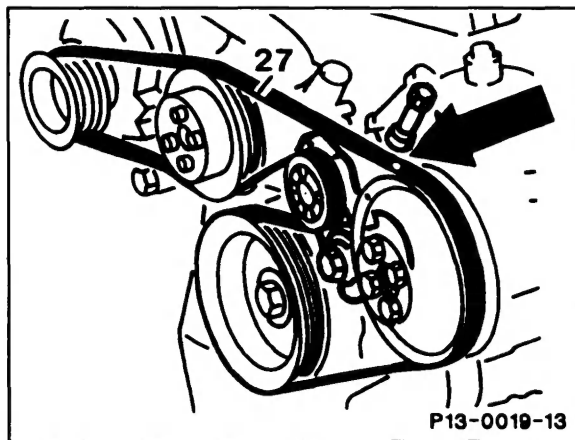
- To interrupt the fuel supply disconnect engine plug connector (X26/2) on right side of vehicle.

**Note for Diesel engines**

- While cranking, press shut off lever (arrow) to prevent the engine from starting.

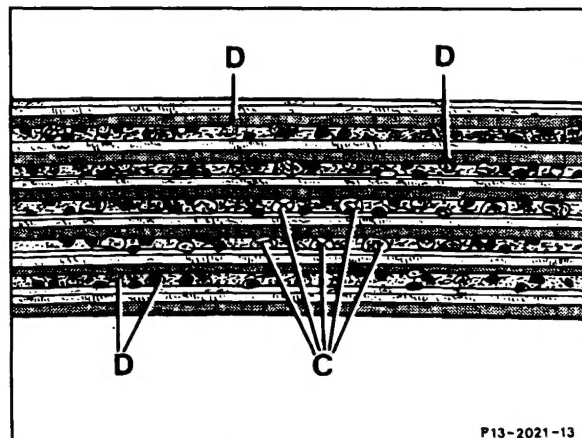
**Checking poly-V-belt**

- Mark poly-V-belt clearly using chalk.
- Crank engine in steps while checking the poly-V-belt for damage.
- End the process when the mark is visible again (one full turn of the belt).
- The poly-V-belt must be replaced according to SMS Job No. 13-342 (on separate order) if the damage patterns on the following pages are evident:

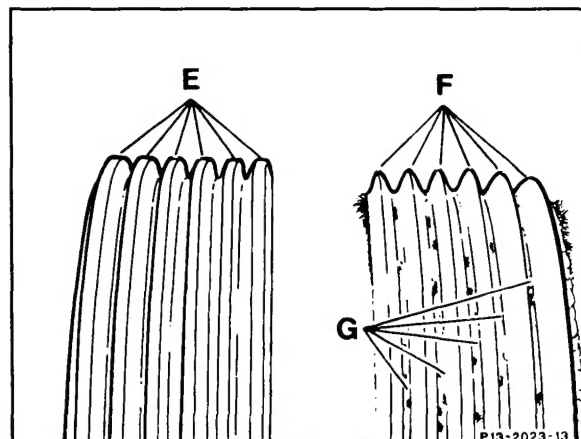


## Damage patterns

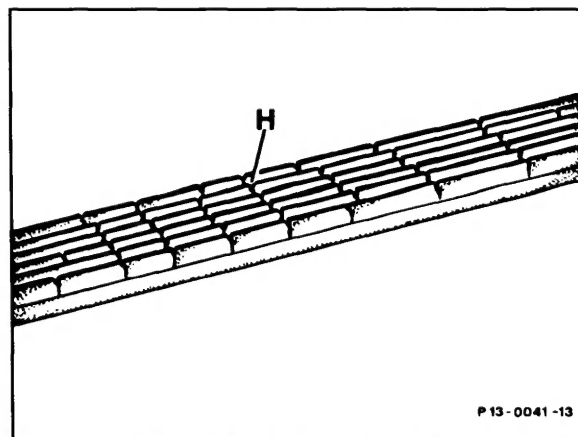
- Rubber lumps in rib base (C).
- Dirt or stone deposits (D).



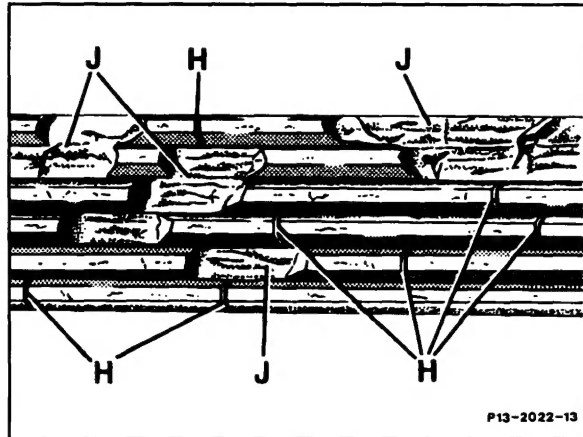
- Flank wear (F, ribs are pointed - trapezoidal when new, E).
- Strand showing through rib base (G, brighter spots).



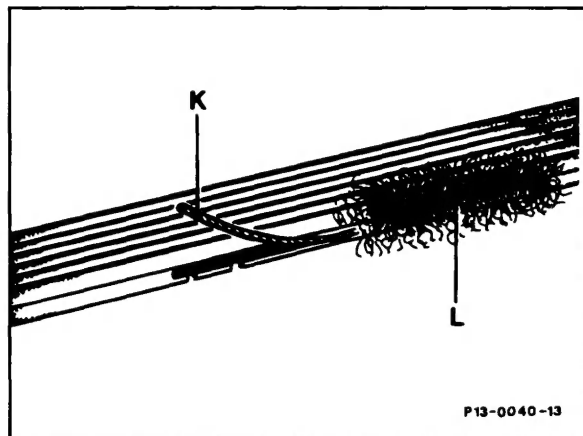
- Transverse cracks (H) in several ribs.



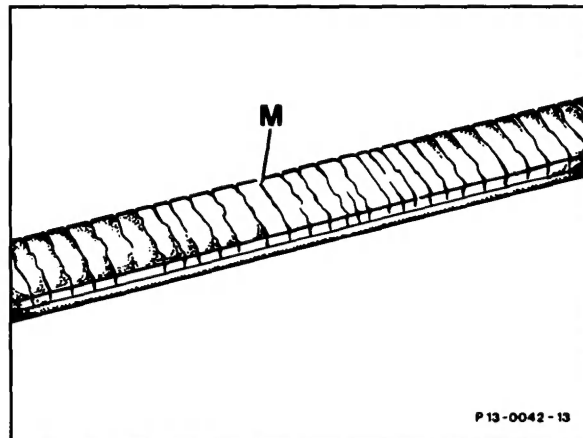
- Transverse cracks in ribs (H) and/or rib chunking (J).



- Strand (K) pulled out laterally or outer strands frayed (L).

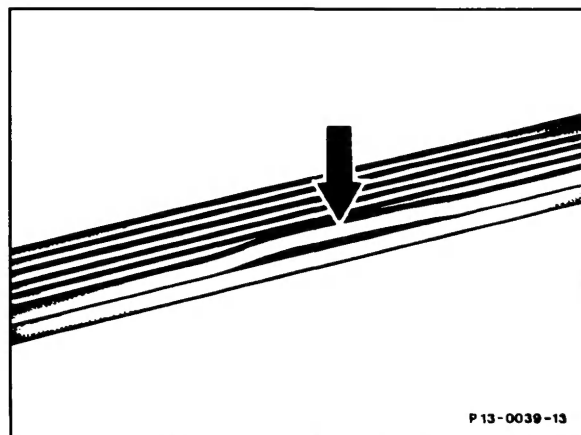


- Transverse cracks (M) on back.





- Rib separated from belt (arrow).



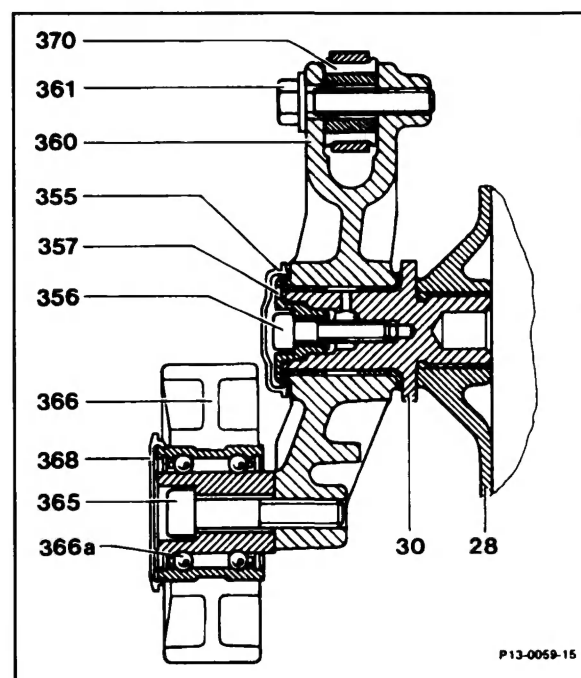
- On diesel engines, with 1st version tensioning lever bearing, check the following parts:

**Check pivot shaft (30) of tensioning lever (360) for tight seat (visual inspection)**

- When the pivot shaft is loose, the shaft collar no longer rests against the timing housing cover (28). This is also recognized by misalignment of tensioning pulley.

**Check tensioning lever bearing for wear (visual inspection)**

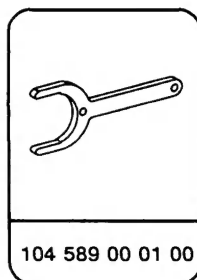
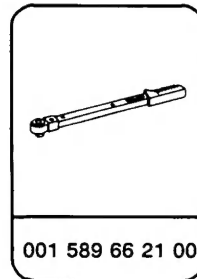
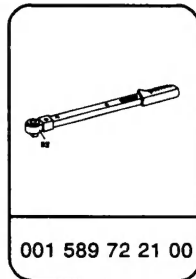
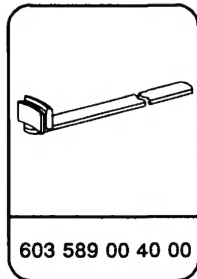
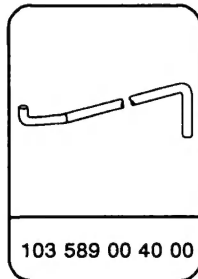
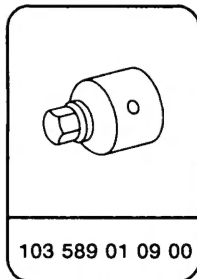
- Tensioning lever bearing bushings are worn out, resulting in considerable play between pivot shaft (30) and tensioning lever (360). Recognized by tilted position of tensioning pulley.



## Replacing poly-V-belt

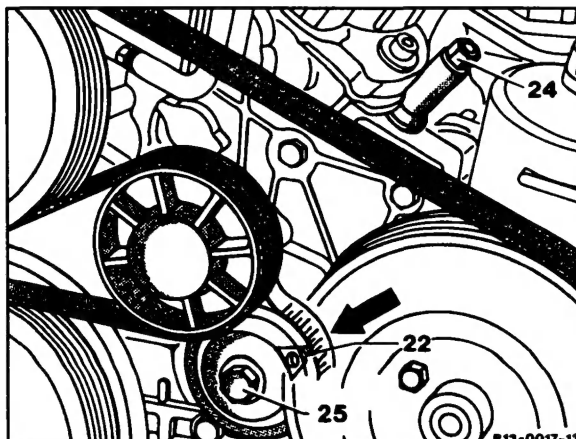
Torque specifications (Nm)		Engine	
Viscofan clutch on coolant pump or bearing body		103, 104, 602, 603	45
Tensioning device mounting bolt (M 12)	19 mm	102, 103	75
	17 mm	102	80
Fan to viscofan clutch		103, 104	10

## Special tools

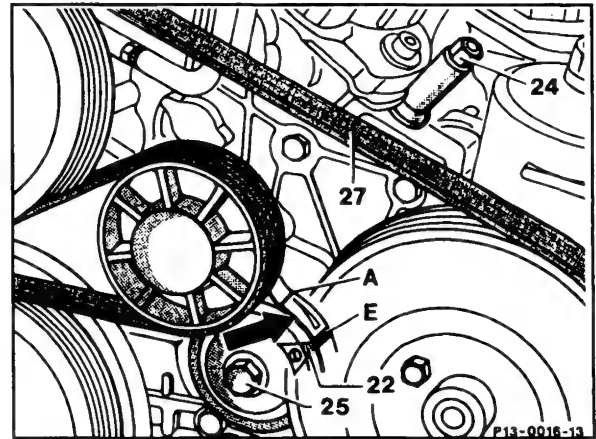


## Engine 102

- Loosen screw (25) by 1/4-1/2 turn.
- Loosen tensioning device with tensioning nut (24) (turn counterclockwise) until poly-V-belt (27) can be removed.
- Check the pulley profiles and the tensioning device for damage and dirt and replace if required (e.g. worn out tensioning device bearing bushing, dents in the pulleys, etc.).



- On vehicles produced up to the middle of October 1986, slide adjusting pointer (22) to the left until the tip of the pointer is above the first dividing line of the adjusting scale (arrow).
- On vehicles produced as of the middle of October 1986, slide adjusting pointer to the left until the tip of the pointer is above the thin line (A) of the adjusting scale.



## Installing poly-V-belt:

- Start in numerical sequence of belt routing diagrams at tensioning pulley (1) (for illustrations, refer to following pages).

## Note:

Do not use belt wax or similar products.

- Check the seating of the poly-V-belt on the belt pulleys.
- On vehicles produced up to the middle of October 1986, turn the tensioning nut (24) to the right until the tip of the adjusting pointer (22) is positioned between the 8th and 9th index mark.
- On vehicles produced as of the middle of October 1986, keep turning tensioning nut to the right until the tip of the adjusting pointer is centered above the thick line (E) of the adjusting scale.
- Tighten bolt (25) as follows:

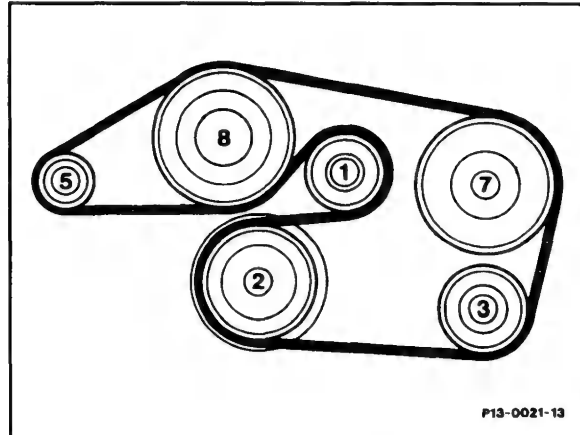
Width between flats 19 mm	75 Nm
Width between flats 17 mm (shouldered bolt)	80 Nm

## Engine 102

Belt routing diagram on vehicles with power steering and A/C compressor

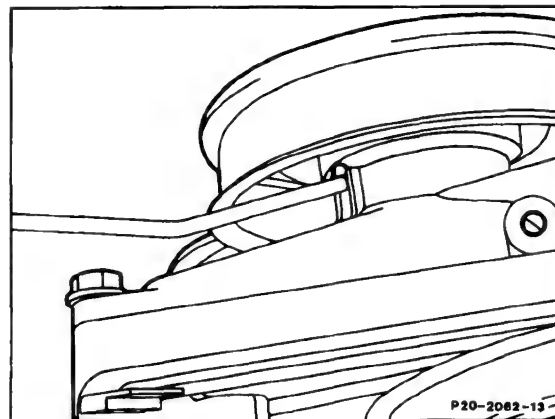
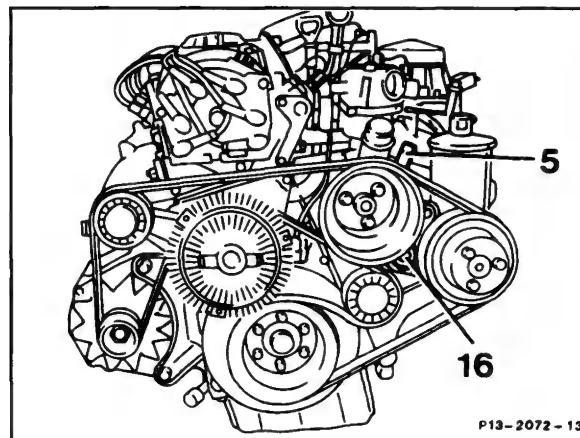
Belt length: 1980 mm

- 1 Tensioning pulley
- 2 Crankshaft
- 3 A/C compressor
- 5 Generator
- 7 Power steering pump
- 8 Coolant pump



## Engine 103

- Loosen fan cover and place on fan.
- On Model 201: remove radiator.
- On all models unscrew viscofan clutch with fan. Remove fan cover.
- For loosening and tightening of hex. socket screw, use special tool 103 589 01 09 00 and torque wrench 001 589 72 21 00.
- Lock pulley by simultaneously engaging counterhold 103 589 00 40 00 in bearing bracket notch and in hub bore.
- Loosen screw (16) by about 1/4 to 1/2 turn.
- Release tensioning device with tensioning nut (5) (turning counterclockwise) until belt can be removed.
- Check pulley profiles and tensioning device for damage and contamination, replace if required (e.g. worn out bearing points of tensioning device, dents in pulleys etc.).

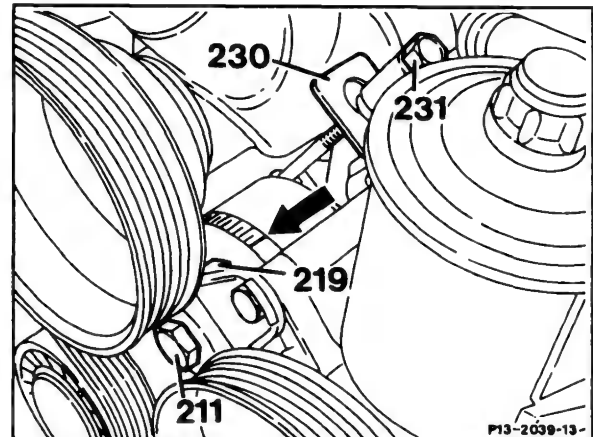


- Turn adjusting pointer (219) to the right (seen from the front) and set adjacent to the 1st index mark (arrow), on vehicles as of 02/1988, set on the cast mark on the right (seen from the front).

## Installing poly-V-belt:

- Start in numbering sequence of belt routing diagrams, start with tensioning pulley (1).

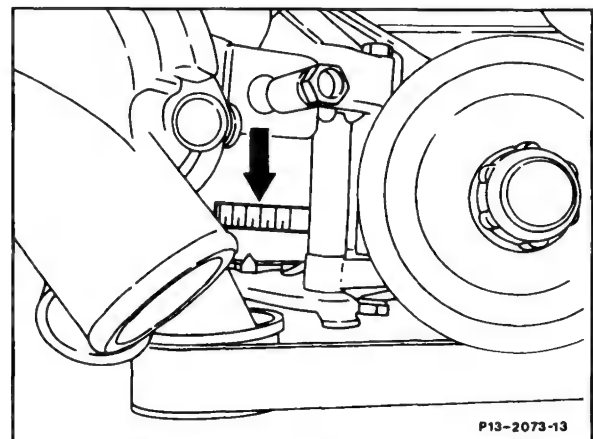
- Do not use belt wax or similar products.



- Turn clamping nut (231) to the right until the adjusting pointer is positioned over the 7th index mark (arrow), on vehicles as of 2/88 over the left mark accordingly (seen from the front).

- Tighten bolt (211) to 75 Nm (reference value).

**Note:** Starting November 1986 the generator is installed with a lower collar screw 13 mm. When this collar screw is removed, the poly-V-belt can be loosened by swiveling the generator and can be tensioned to its original condition without loosening bolt (211).



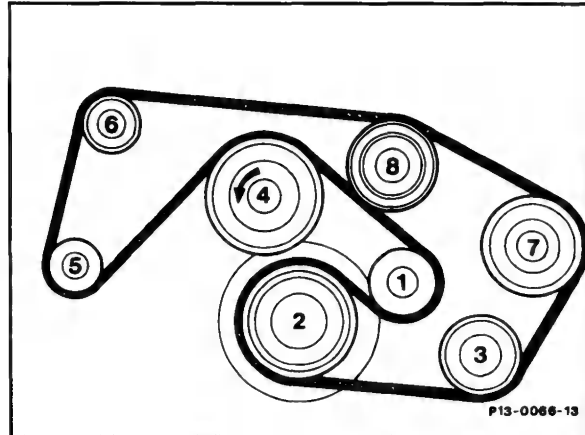
- Check if belt is correctly seated on pulleys.
- Insert and install viscofan clutch with fan cover.
- When tightening hex. socket screw (tightening torque 45 Nm) apply counterhold to pulley.
- To do this, insert counterhold at back of hub and engage simultaneously into holding groove of bearing bracket.

Then remove counterhold.

## Engine 103

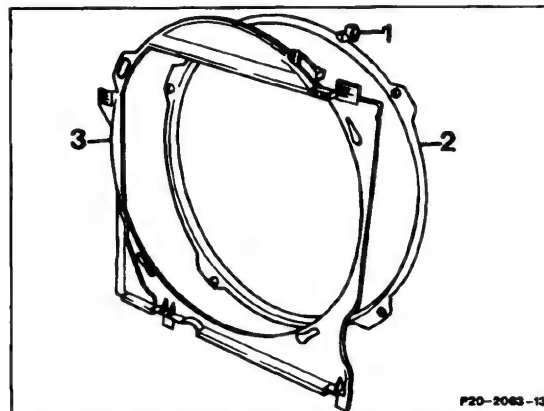
Belt routing diagram on vehicles with air conditioning compressor  
Belt length: 2255 mm

- 1 Tensioning pulley
- 2 Crankshaft
- 3 Compressor
- 4 Fan
- 5 Generator
- 6 Deflector pulley
- 7 Power steering pump
- 8 Coolant pump

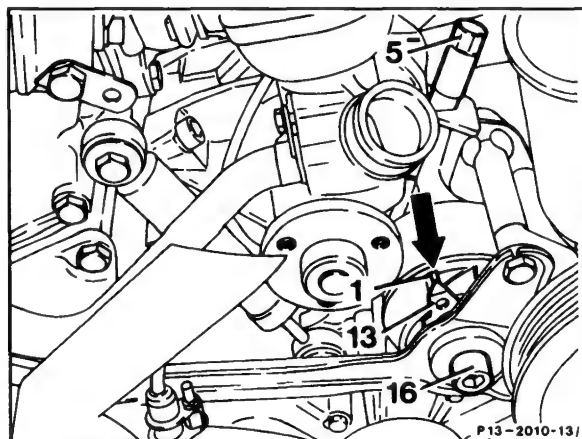


## Engine 104

- Pull out locking pin (1) on fan cover.
- Turn ring (2) to the left and remove.

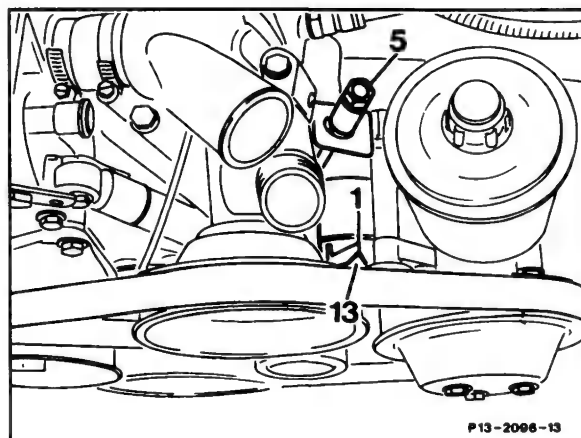


- Loosen screw (16) for approx. 1/4 to 1/2 turn.
- Loosen tensioning unit with tensioning nut (5) (**turn counterclockwise**) until the belt can be removed.
- Check pulley profiles and tensioning device for damage and contamination and replace, if required (e.g. worn out bearing points of tensioning device, dents in pulley etc.).

**Install poly-V-belt:**

- Starting in numerical sequence of belt routing diagrams at tensioning pulley (1).
- Note:** Do not use belt wax or similar products.

- Set pointer (13) of tensioning unit to mark 2.
- Turn tensioning nut (5) downwards until adjusting pointer (13) is in alignment with mark 1 (arrow).
- Check seat of belt on pulleys.
- Tighten screw (16) to 75 Nm.
- Install ring of fan cover in reverse sequence.

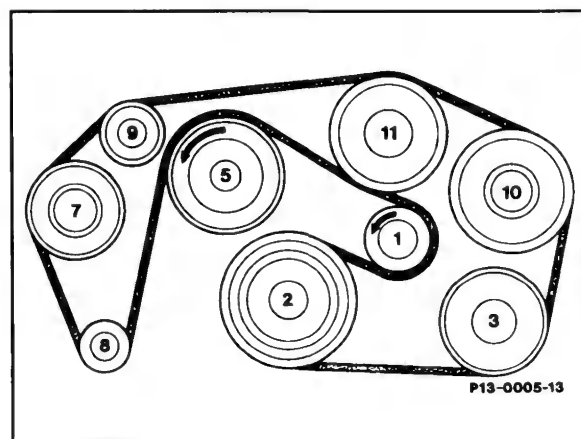


Engine 104 models 124, 129 up to 01/91

Belt routing diagram vehicles with air pump and with air conditioning compressor,

Belt length: 2445 mm; 6 ribs

- 1 Tensioning pulley
- 2 Crankshaft
- 3 Air conditioning compressor
- 5 Fan
- 7 Air pump
- 8 Generator
- 9 Guide pulley, upper
- 10 Power steering pump
- 11 Coolant pump

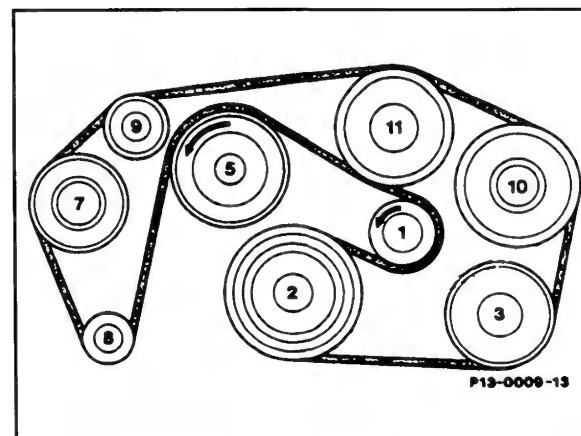


Engine 104 models 124, 129 starting 01/91, model 140

Belt routing diagram vehicles with air pump and with air conditioning compressor,

Belt length: 2440 mm  
models 124, 129, 6 ribs; model 140 8 ribs

- 1 Tensioning pulley
- 2 Crankshaft
- 3 Air conditioning compressor
- 5 Fan
- 7 Air pump
- 8 Generator
- 9 Guide pulley, upper
- 10 Power steering pump
- 11 Coolant pump



**Engine 119**

- Pull locking pin from fan cover.
- Turn ring to the left and remove.
- Loosen screw (16) approx. 1/4 to 1/2 turn.
- Loosen tensioning device with tensioning nut (12) (**turning counterclockwise**) until the belt can be removed.
- Check pulley profiles and tensioning device for damage and contamination and replace, if required (e.g. worn out bearing points of tensioning device, dents in pulleys etc.).

**Installing poly-V-belt:**

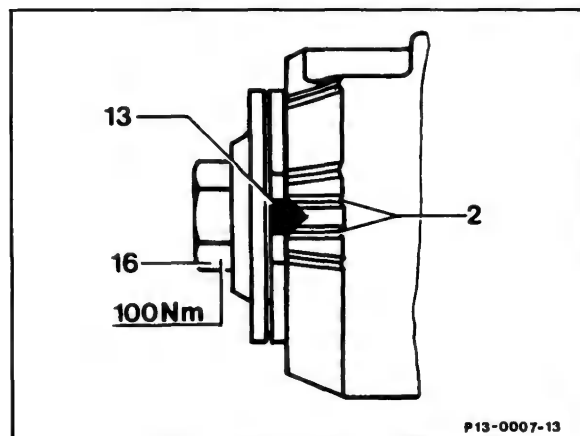
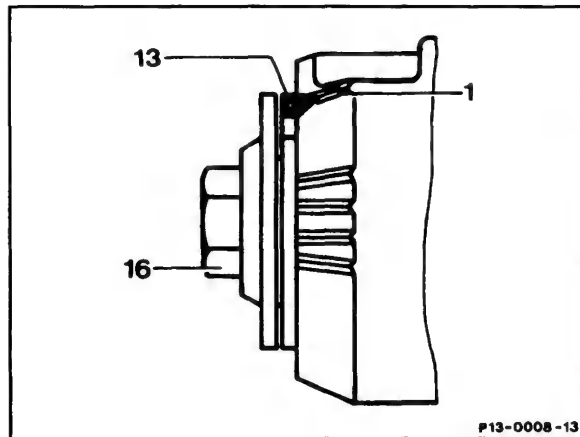
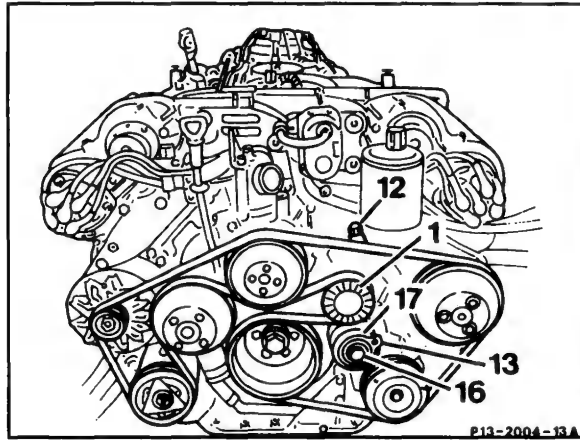
- In numerical sequence of belt routing diagrams, start with tensioning pulley (1).

**Note:**

Do not use belt wax or similar products.

- Set pointer (13) of tensioning device to mark 1.

- Turn tensioning nut (12) clockwise until pointer (13) is in position 2.
- Check that belt is seated correctly on pulleys.
- Torque screw (16) to 100 Nm.
- Install fan cover in reverse order.



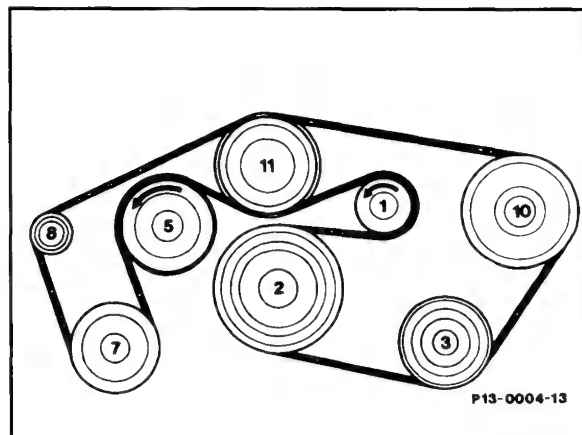


## Engine 119 model 129

### Belt routing diagram

Belt length: 2523 mm; 6 ribs

1. Tensioning pulley
2. Crankshaft
3. A/C compressor
5. Fan
7. Air pump
8. Generator
10. Power steering pump
11. Coolant pump

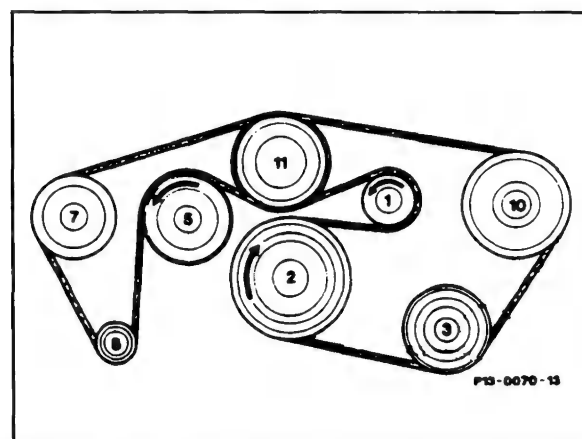


Engine 119.970 model 140.051  
 119.971 model 140.042  
 119.974 model 124.036  
 119.975 model 124.034

### Belt routing diagram

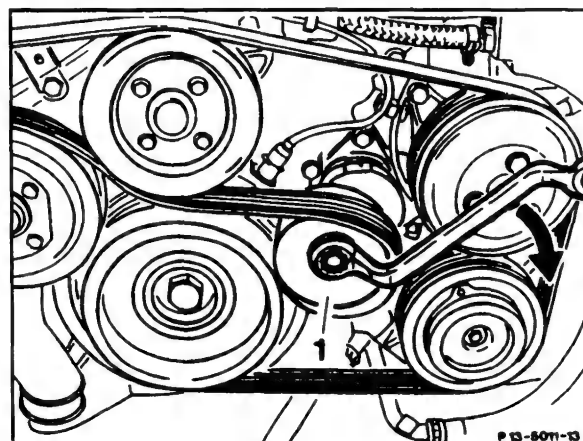
Belt length: 2460 mm; 8 ribs

1. Tensioning pulley
2. Crankshaft
3. A/C compressor
5. Fan
7. Air pump
8. Generator
10. Power steering pump
11. Coolant pump



## Engine 120

- Remove cooling fan (job no. 20-3129)
- Using 15 mm wrench, swing tensioning roller (1) aside in direction of arrow up to stop and no further so that belt can be removed. Check pulley profiles and tensioning device for damage and contamination and replace, if required (e.g. worn out bearing points of tensioning device, dents in pulleys etc.)



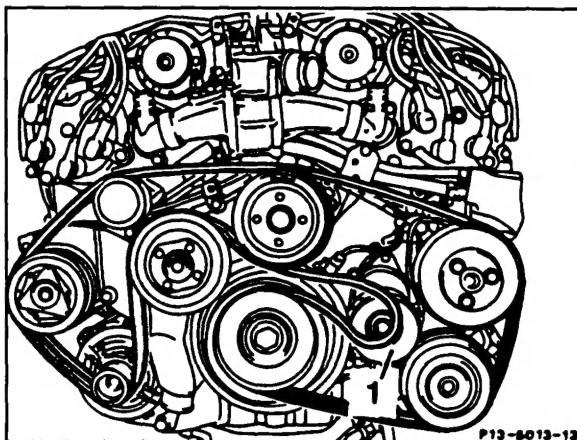
**Installing poly-V-belt:**

- In numerical sequence of belt routing diagrams, start with tensioning pulley (1).

**Note:**

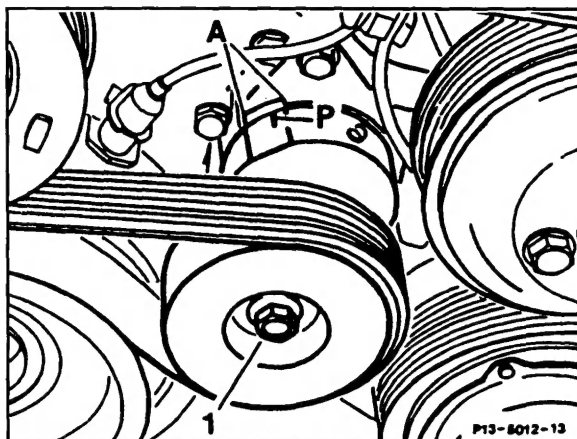
Do not use belt wax or similar products.

- Pretension tensioning pulley (1) and install belt over pulley (1). Check that belt is seated correctly.

**Note:**

When the belt length and tension are correct the positioning mark (P) will be within range (A).

- Reverse procedure to install.

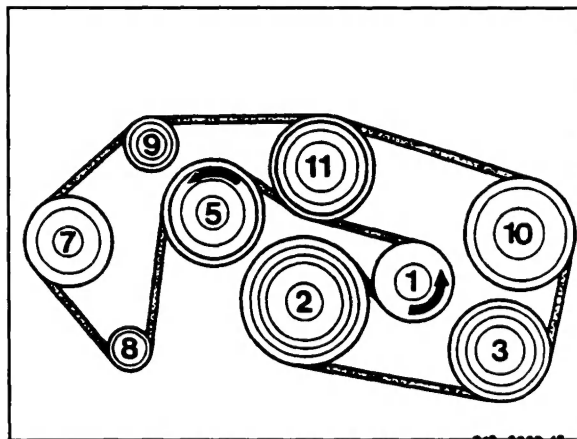


Engine 120.980 Model 140.056/57

Belt routing diagram

Belt length 2585 mm 8 ribs

1. Tensioning pulley
2. Crankshaft
3. A/C compressor
5. Fan
7. Air pump
8. Generator
9. Guide pulley, upper
10. Power steering pump
11. Coolant pump

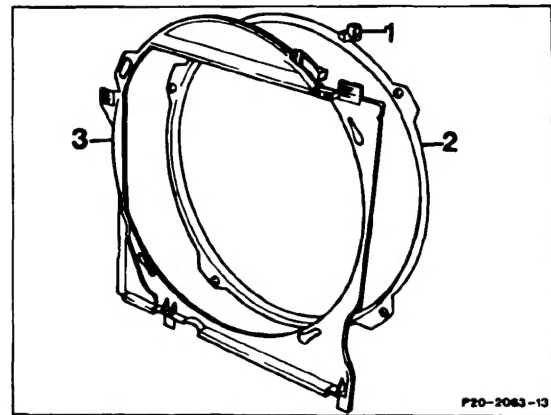


## Engine 601, 602 and 603

**On engine 601**, loosen fan cover and place on fan. Unscrew fan and remove with fan cover.

**On engine 602.911 In model 201** with one piece fan cover, remove radiator.

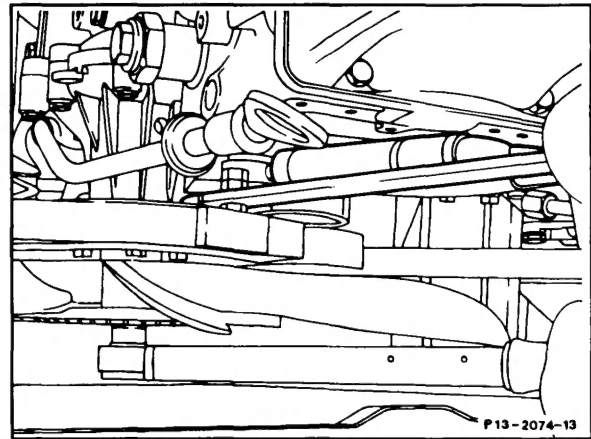
**On engine 602 In model 201** with two piece fan shroud, pull locking pin (1) and turn ring (2) to the left. to open shroud and remove. Place ring on fan. Pull out shroud body (3) and remove ring.



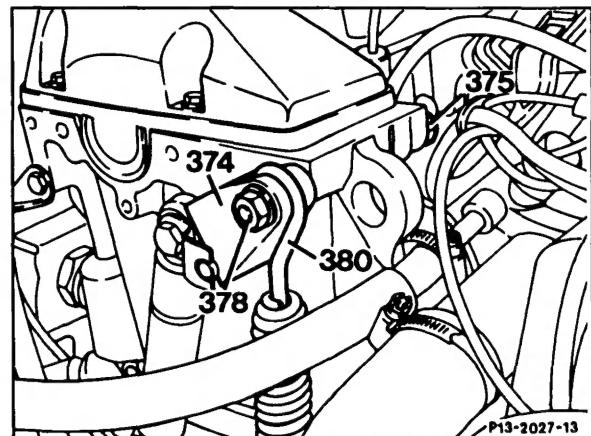
**On engine 602 In model 124**, loosen fan cover and place on fan. Unscrew viscofan clutch with fan and remove with fan cover.

To loosen and tighten hex. socket screw of viscofan clutch, use screwdriver insert 103 589 01 09 00 and counterhold 603 589 00 40 00.

**On engine 603.96 (TURBO)**, the viscofan clutch cannot be removed without removing the radiator.

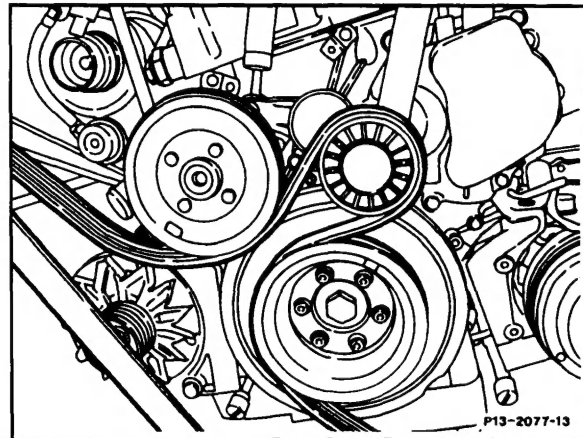
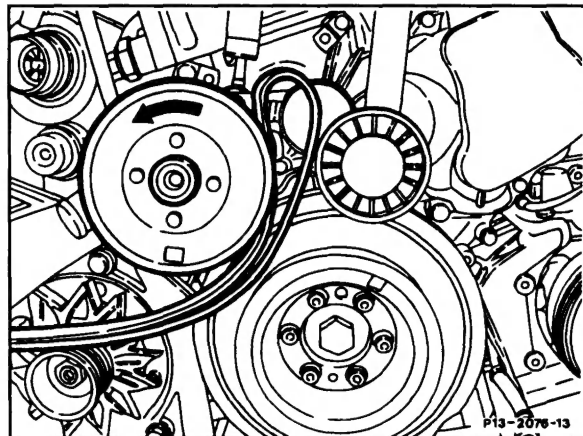
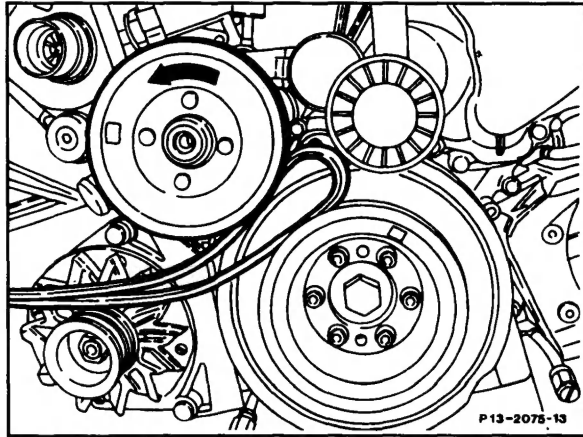


- Loosen tensioning device (vehicle tool or conventional tool):
- Unscrew nut (378).
- Insert a lever (12 - 13 mm dia., approx. 300 mm long) or wheel nut wrench from vehicle tool set into hole on spring tensioning lever (374). Push lever slightly to the left until screw (375) can be pushed back in direction of intake manifold.
- Loosen draw spring (380) by swiveling lever to the right.
- Push back tensioning pulley and remove poly-V-belt.
- Check belt pulley profiles and tensioning device for damage (such as worn out pivot points of tensioning device, dents in pulleys, etc.) and contamination and replace, if necessary.

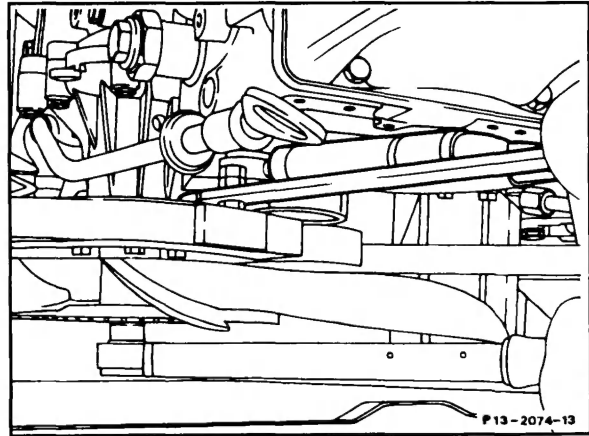


**Installing poly-V-belt:**

- Do not use belt wax or similar products.
- Slightly pull up tensioning pulley. Make a loop in the poly-V-belt with the V-grooves facing outwards, and slip between coolant pump pulley and crankshaft pulley.
- Push poly-V-belt firmly against coolant pump pulley and turn pulley counterclockwise (arrow) until the poly-V-belt is adjacent to tensioning pulley.
- Position poly-V-belt on tensioning pulley and on crankshaft pulley. Then turn free portion of poly-V-belt around and position on air conditioning compressor, power steering pump, coolant pump and generator pulleys.
- Tension poly-V-belt and screw on tensioning device.



- Check seat of poly-V-belt on belt pulleys.
- On engines 601, 602, 603.91 in model 124, install fan or viscofan clutch with fan and fan cover.
- On engine 601, torque fan mounting screw to 28 Nm.
- Torque viscofan clutch mounting screw to 45 Nm. When tightening use counter hold 603 589 00 40 00.
- On engine 602.911 in model 201 without two piece fan shroud, install radiator.



Belt routing diagram for vehicles with power steering and automatic climate control

Belt lengths:

Engine 601: 2120 mm

Engine 602: 2100 mm

Engine 603.96: 2145 mm

Engine 603.970: 2120 mm

1. Tensioning pulley
2. Crankshaft
3. A/C compressor
5. Generator
7. Power steering pump
8. Coolant pump

